

Modulo 2 Addition (XOR)

+	0	1
0	0	1
1	1	0

Modulo 2 Multiplication (XOR)

*	0	1
0	0	0
1	0	1

Figure 1

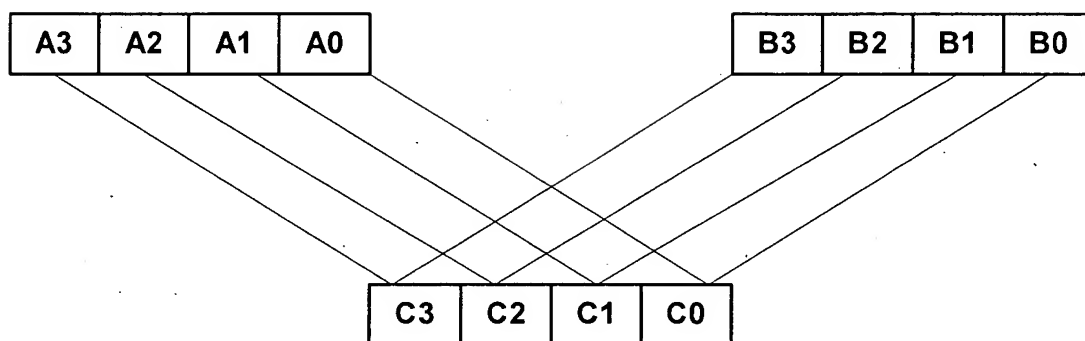


Figure 2

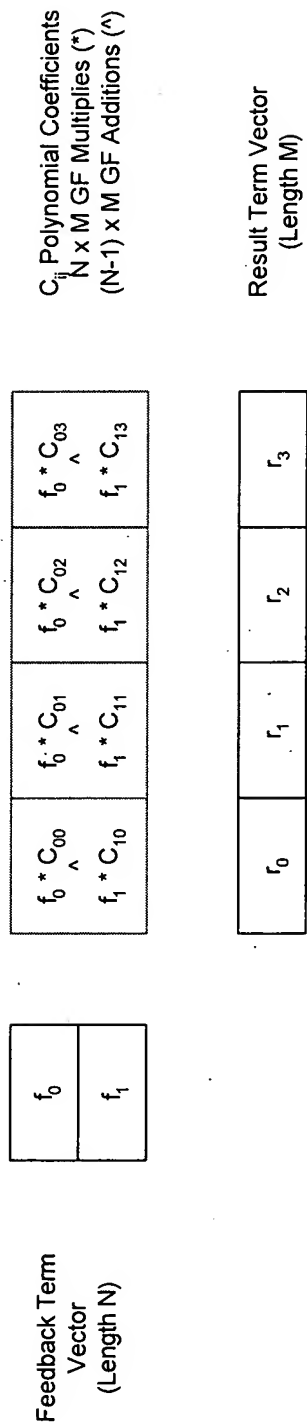


Figure 3

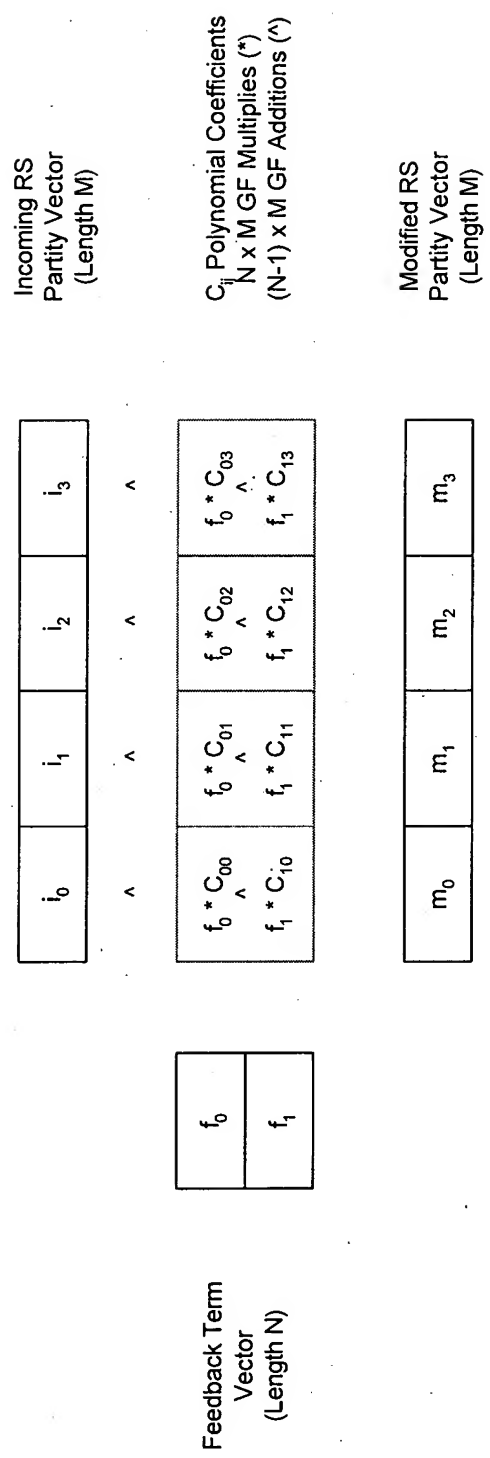


Figure 4

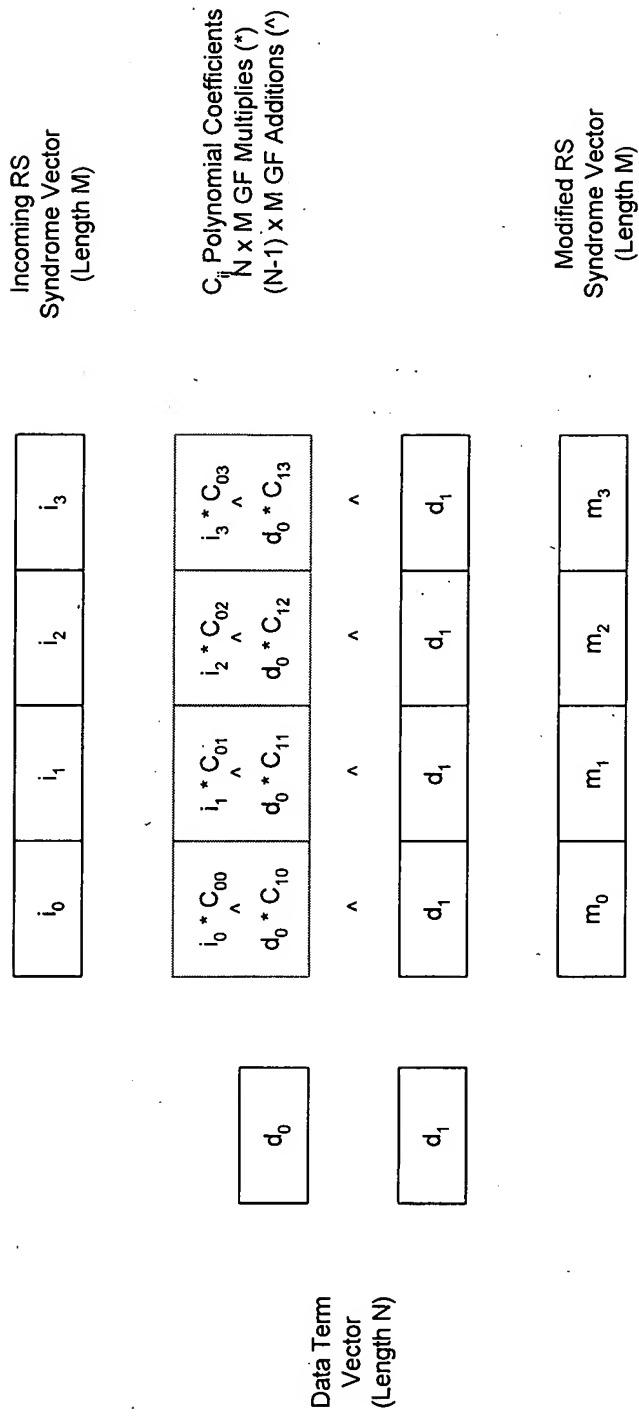
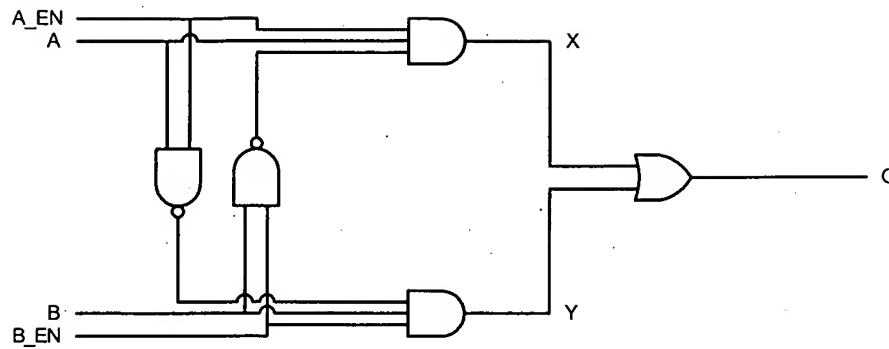
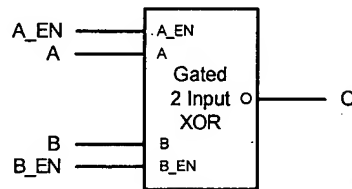


Figure 5



Gated 2 Input XOR Logic



Gated 2 Input XOR Symbol

A	B	A_EN	B_EN	X	Y	O	Notes
-	-	0	0	0	0	0	Block
0	0	1	0	0	0	0	Pass A
0	1	1	0	0	0	0	
1	0	1	0	1	0	1	
1	1	1	0	1	0	1	
0	0	0	1	0	0	0	Pass B
0	1	0	1	0	1	1	
1	0	0	1	0	0	0	
1	1	0	1	0	1	1	
0	0	1	1	0	0	0	A ^ B
0	1	1	1	0	1	1	
1	0	1	1	1	0	1	
1	1	1	1	0	0	0	

Gated 2 Input XOR Truth Table

Figure 6

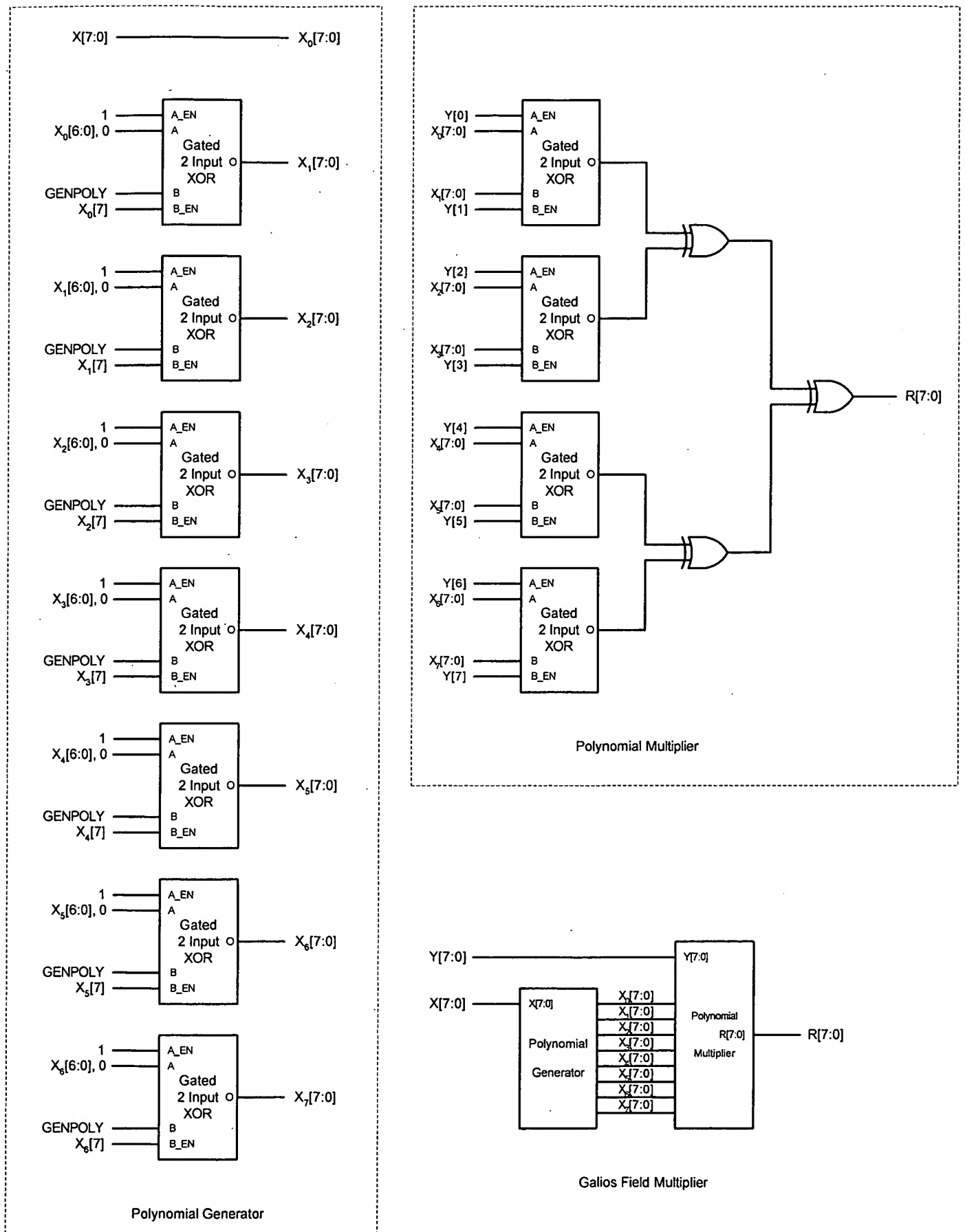


Figure 7

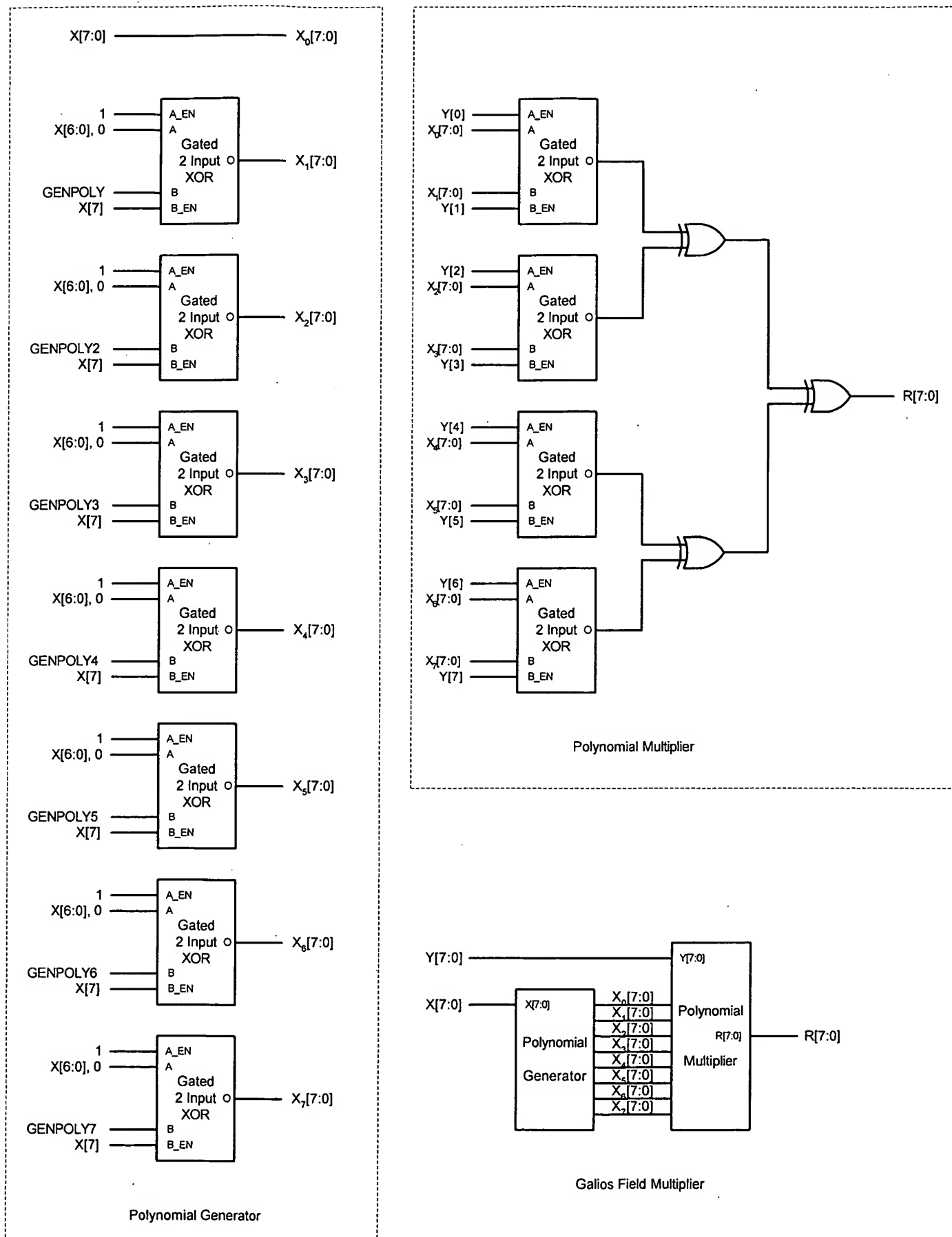
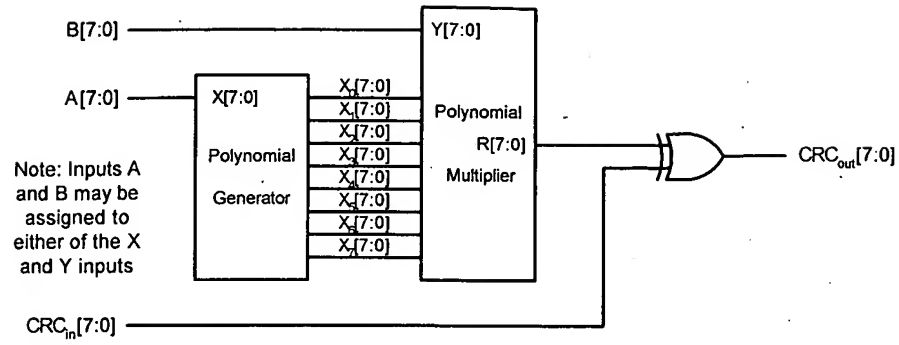


Figure 8



Scalar instruction: $crc = crc \wedge gf_mult(a, b)$

As used in the example software, a is the feedback term and b is the polynomial term

Figure 9

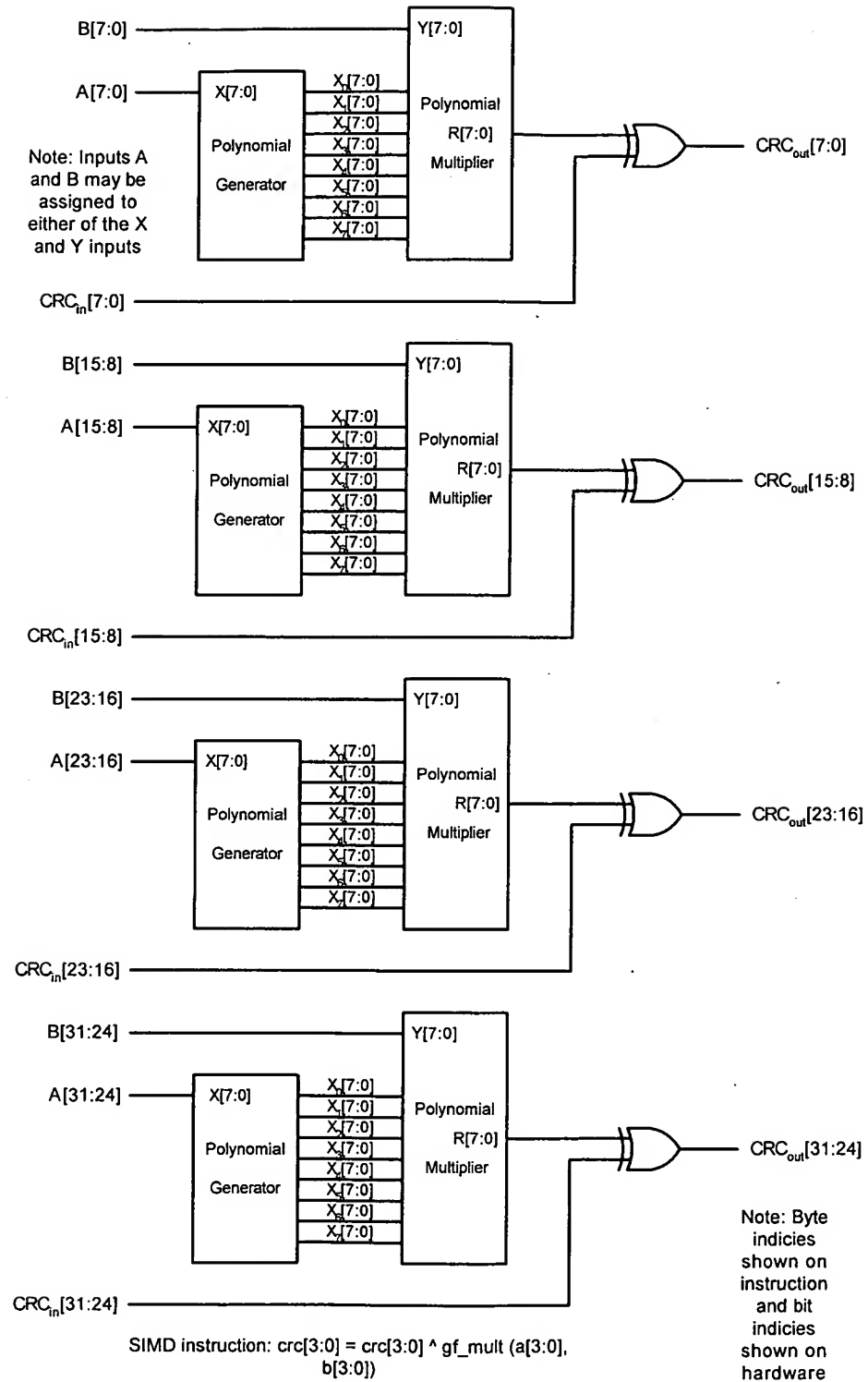


Figure 10

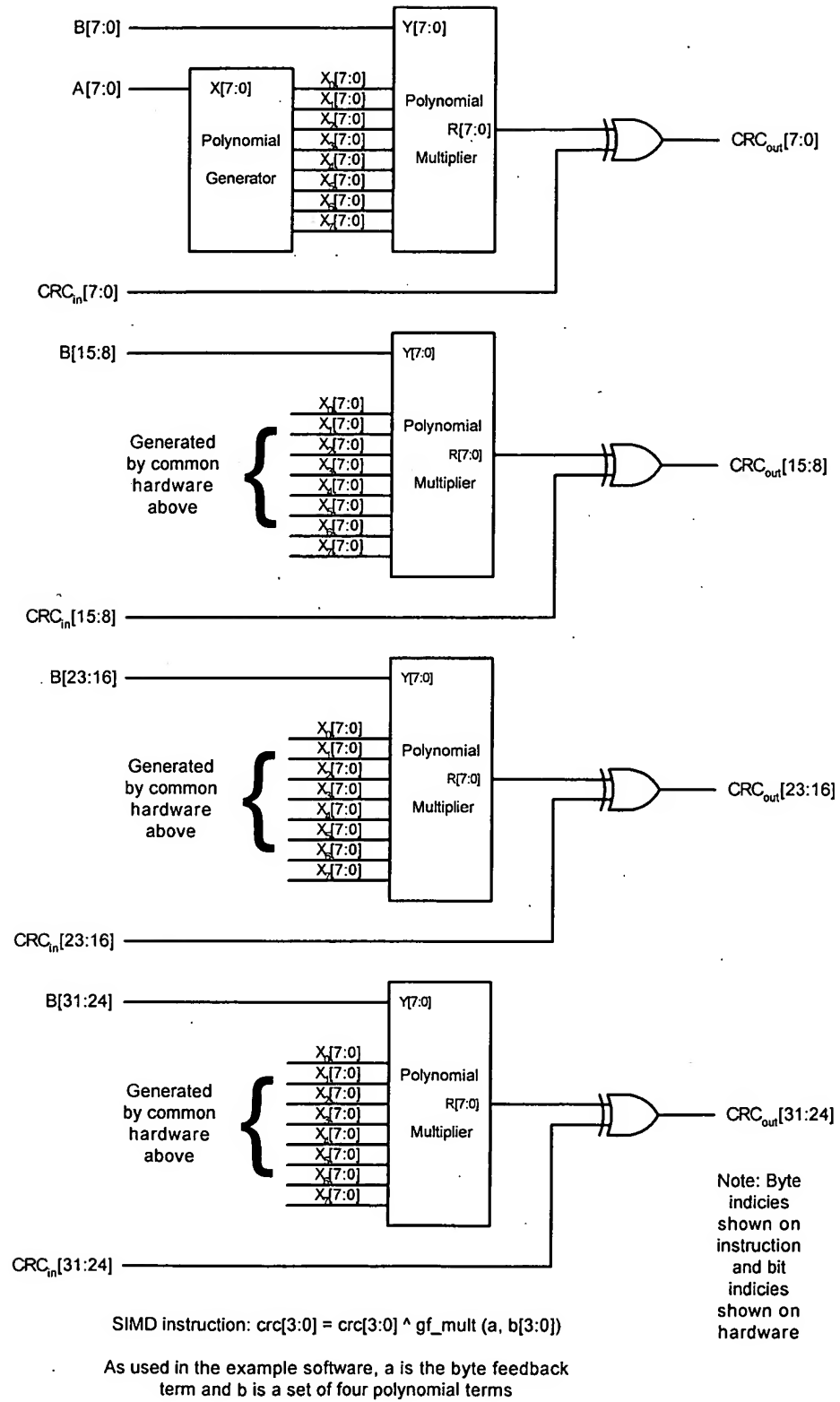
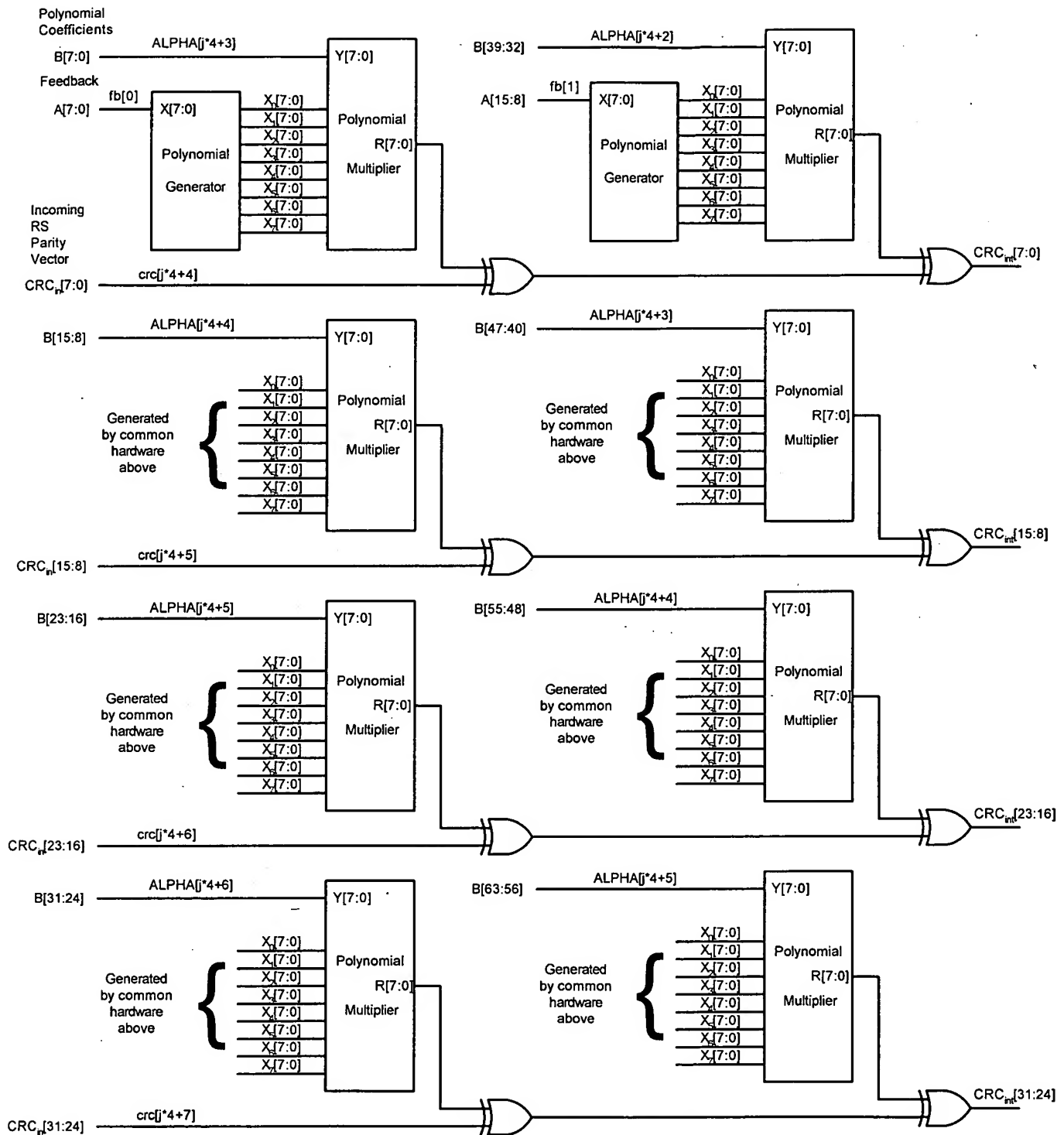


Figure 11



GF Kernel instruction: $crc[3:0] = crc[3:0] \wedge gf_mult(a[3:0], b[15:0])$

As used in the example software, a is a set of four byte feedback term and b is a set of sixteen polynomial terms

The set of sixteen polynomial terms could be referenced from a ROM as part of the GF Kernel instruction processor as only a small number of terms are necessary for each Reed Solomon coder type

Note: Byte indices shown on instruction and bit indices shown on hardware

Figure 12a

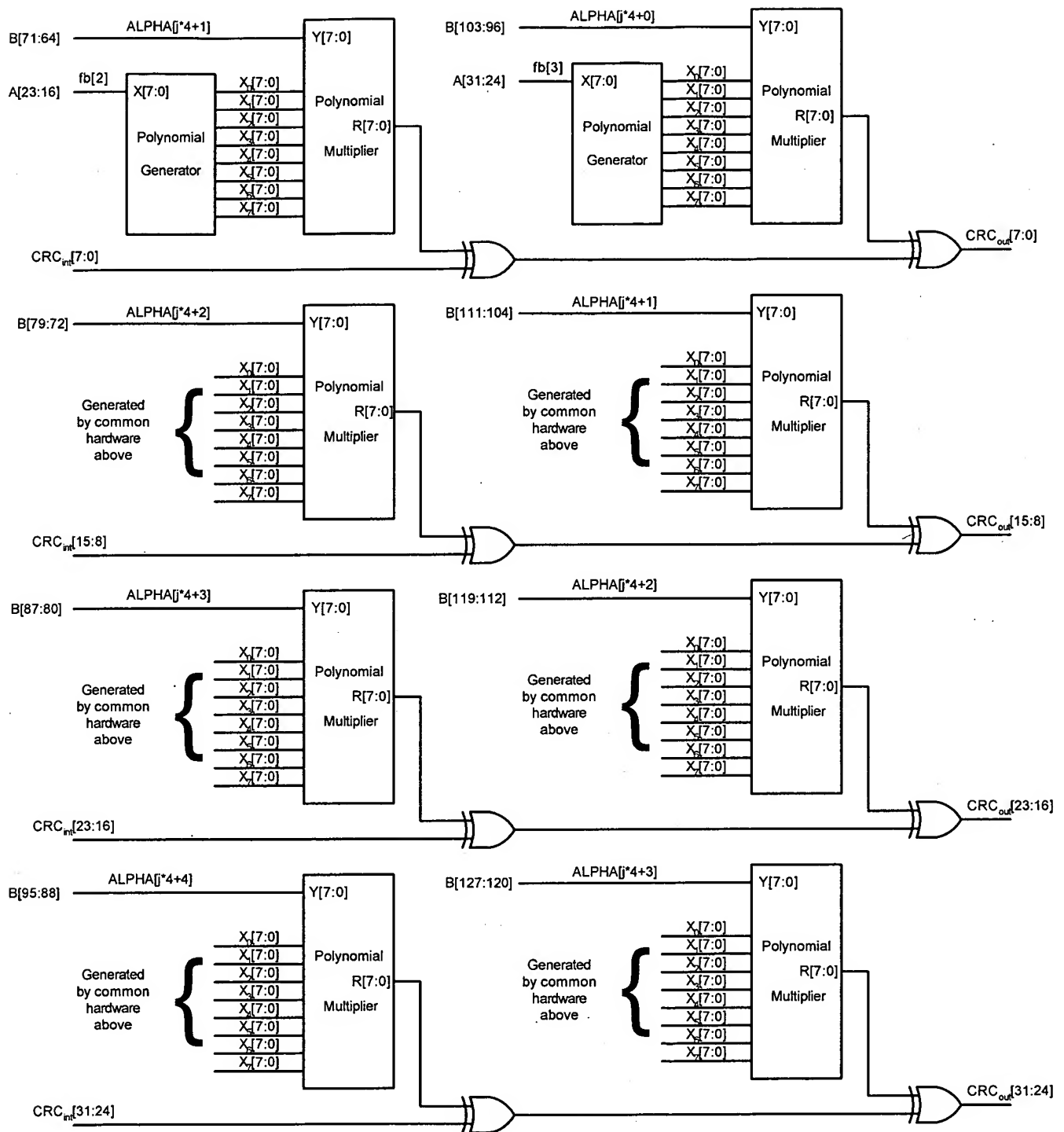
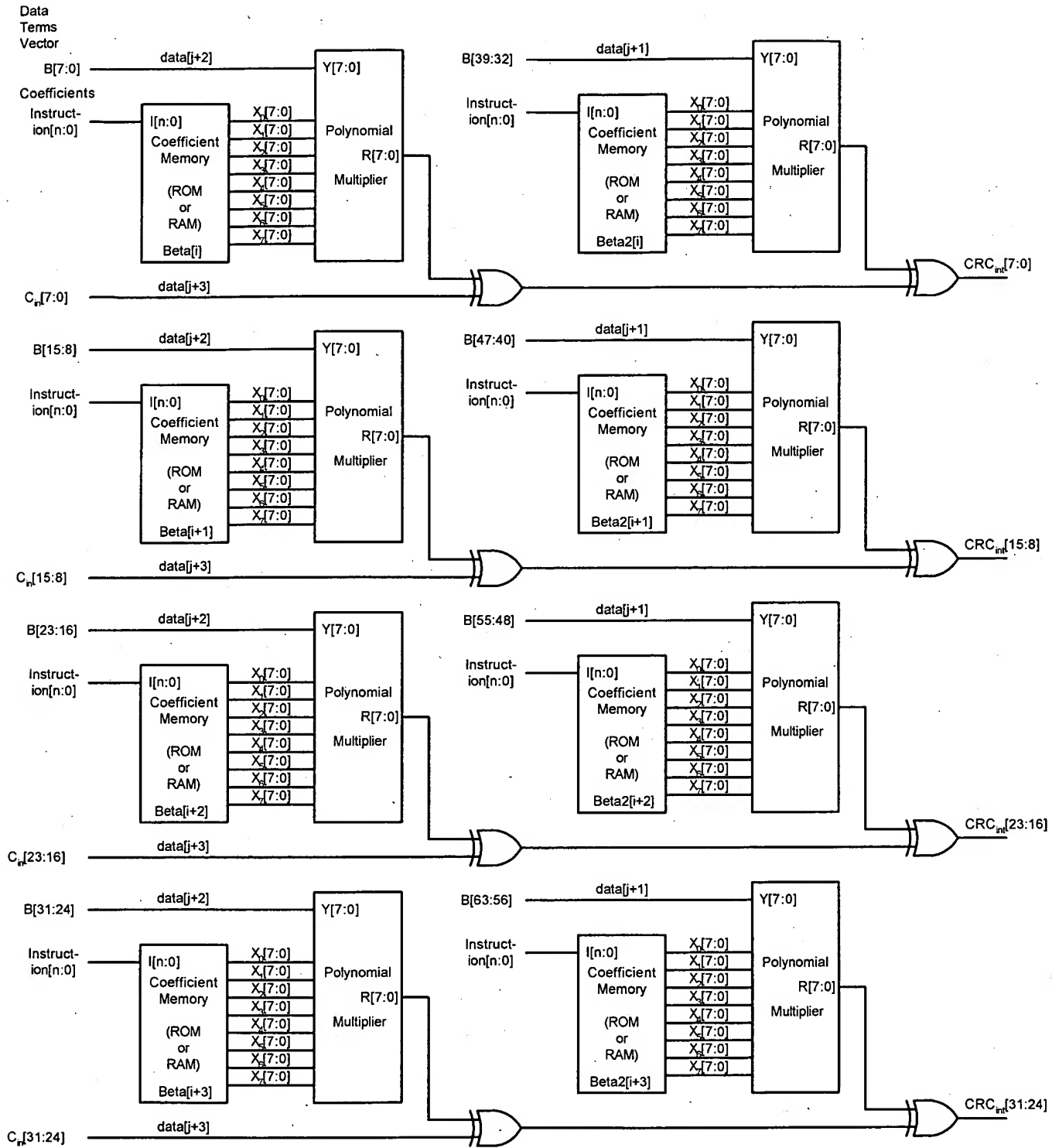


Figure 12b



GF Kernel instruction: $c[3:0] = c[3:0] \wedge gf_mult(a[3:0], b[15:0])$

As used in the example software, a is a set of four byte feedback term and b is a set of sixteen polynomial terms

The set of sixteen polynomial terms should be referenced from a ROM as part of the GF Kernel instruction processor as only a small number of terms are necessary for each Reed Solomon coder type

Note: Byte indices shown on instruction and bit indices shown on hardware

Figure 13a

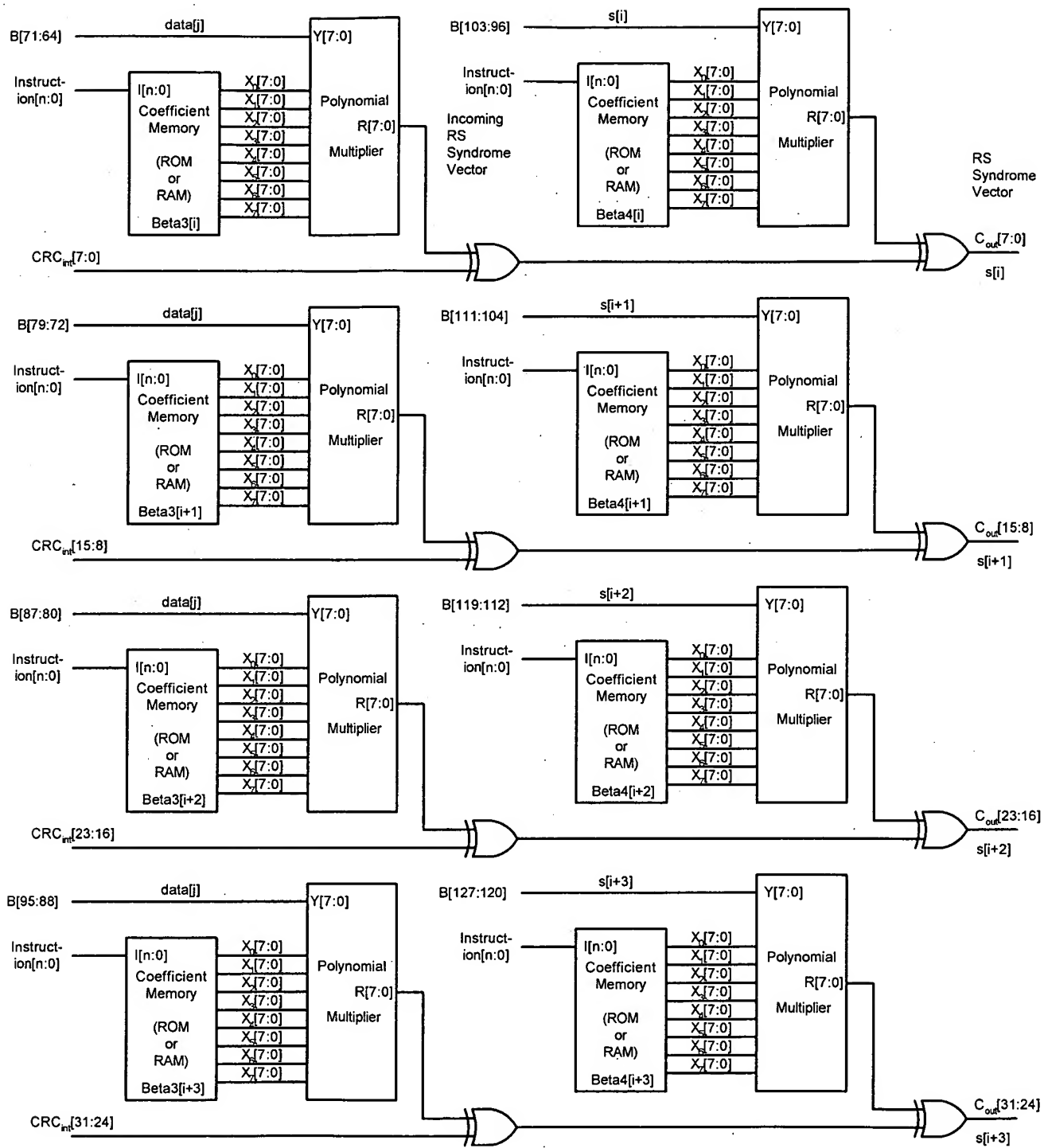
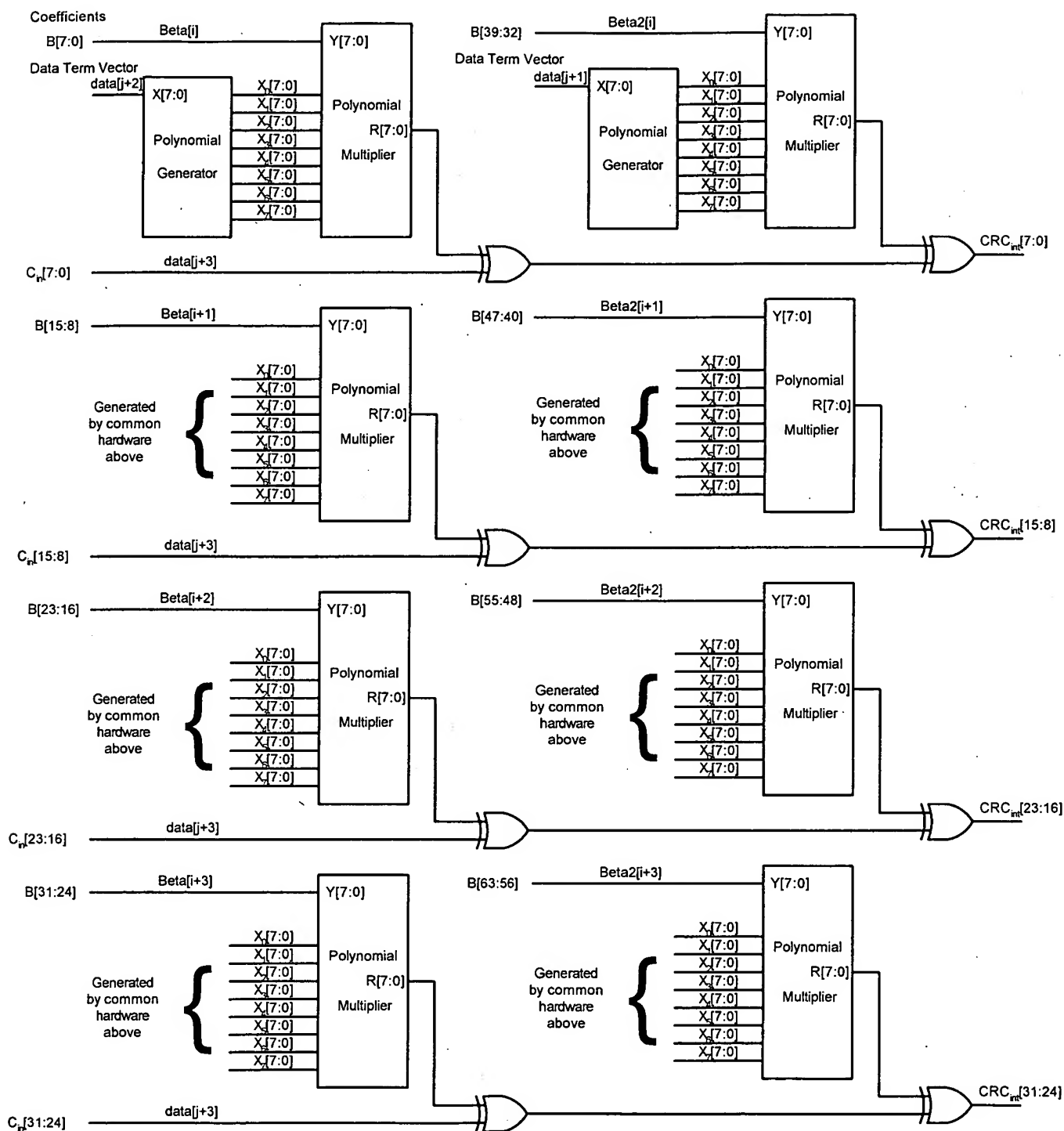


Figure 13b



GF Kernel instruction: $c[3:0] = c[3:0] \wedge gf_mult(a[3:0], b[15:0])$

As used in the example software, a is a set of four byte feedback term and b is a set of sixteen polynomial terms

The set of sixteen polynomial terms should be referenced from a ROM as part of the GF Kernel instruction processor as only a small number of terms are necessary for each Reed Solomon coder type

Note: Byte indices shown on instruction and bit indices shown on hardware

Figure 14a

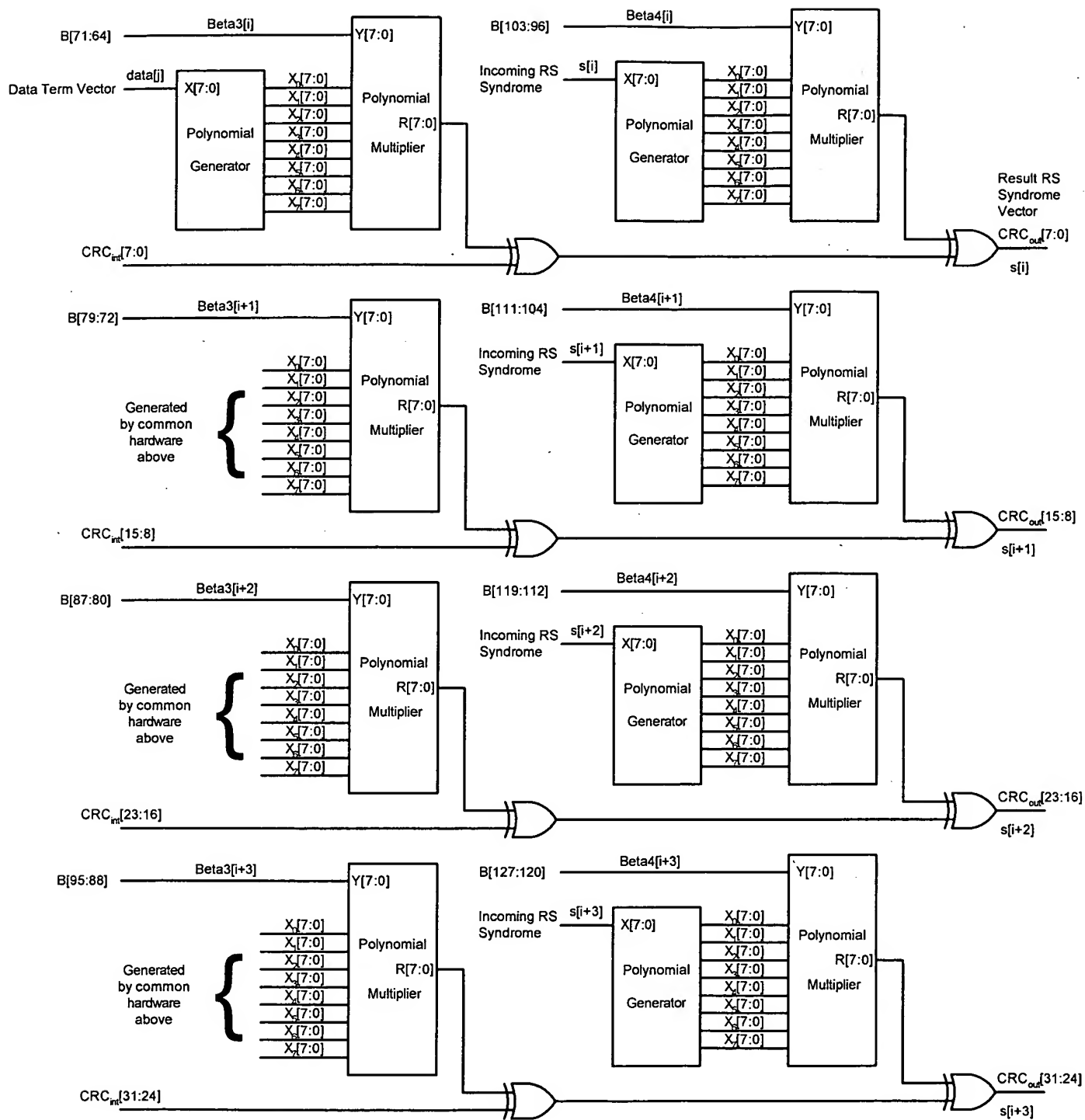


Figure 14b